



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,701	07/27/2006	Sebastien Joseph Roy	AP893USN	3530
33361 7590 04/01/2010 ADAMS PATENT & TRADEMARK AGENCY P.O. BOX 11100, STATION H OTTAWA, ON K2H 7T8 CANADA			EXAMINER NGUYEN, DUC M	
			ART UNIT 2618	PAPER NUMBER
			MAIL DATE 04/01/2010	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/587,701	Applicant(s) ROY, SEBASTIEN JOSEPH	
	Examiner DUC M. NGUYEN	Art Unit 2618	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,6,8,12,15 and 17 is/are allowed.
- 6) ☒ Claim(s) 1-2, 4-5, 7, 9-11, 13-14, 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This action is in response to applicant's response filed on 5/15/09. Claims 1-17 are now pending in the present application. **This action is made final.**

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims **1-2, 4-5, 7, 9-11, 13-14, 16** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

As to claims **1**, the claims recited the limitation "L is the maximum of the channel impulse response in symbol period", this limitation was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim Rejections - 35 USC 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention

Art Unit: 2618

was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims **1, 9, 10** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Li et al** (US 2004/0146024), hereafter **Li'024** in view of and **Li et al** (US Pat. Number **6,795,392**), hereafter **Li'392**.

Regarding claim **1**, **Li'024** discloses

an array receiver for processing signals received from a plurality of transmitting users via an array antenna having an array of N antenna elements providing a set of antenna signals, each comprising information from each user, wherein said receiver has a common preprocessing section for sampling each of the antenna element signals as claimed (see Fig. 2 regarding input signals $i[n]$ from M antennas and [0022] regarding sampled process), and

a common processing for sampling each of antenna element signal and processing samples of at least some of said antenna signals $i[n]$ to form a plurality of basis signals $d[n]$, each having R dimension, said basis signals together having **fewer** space-time dimensions ($R \times M$) than the space-time dimensions ($N \times L$) of the combined antenna signals, where L is the maximum of channel impulse response in symbol period (see Fig. 2 regarding output signals $d[n]$, see Fig. 3 and [0020, 29]) regarding space-time dimension with L is the maximum of channel impulse response in symbol period); and

a plurality of signal processing units (joint detectors JD) each having a plurality of inputs coupled to the common preprocessing section for receiving all of the basis

Art Unit: 2618

signals, each processing unit processing and combining said basis signals to produce a respective one of a set of estimated received signals each for a corresponding desired one of the users (see Fig. 4 regarding output signals $S[n]$ and [0046 – 0064]),

the common preprocessing section comprising filtering means for combining all of the antenna signals X_i to provide said plurality of basis signals $d[i]$, each of the basis signals comprising a different combination of the antenna signals, each of the signal processing units combining the basis signals to provide a user-specific output signal $S[i]$ (see Fig. 3 and [0038 – 0045]), and

updating means for periodically updating parameters of the filtering means used for deriving each particular basis signal such that each user-specific output signal will exhibit a desired optimized concentration of energy of that desired user's received signal as received by the array antenna (see [0033-0048], noting for “maximum signal energy” in [0038]).

However, Li'024 fails to explicitly teach M antennas $> N$ users. However, Li'092 teaches that the number of antennas can be more or less regardless of the number of users (see col. 3, lines 20-24 regarding one or many antennas). Since one skilled in the art would recognize that the dimension of antennas (M), the dimension of filters (P) and the dimension of users (N) can be arbitrary numbers depending on design choices, it would have been obvious to one skilled in the art at the time the invention was made to modify Li'024 to provide a larger number of antennas with respect to a smaller number of detected user as mentioned by Li'092 (i.e, M antennas $> N$ users), thereby providing a plurality of basis signals $d[n]$ together having **fewer** space-time dimensions than the

Art Unit: 2618

space-time dimensions of the combined antenna signals as claimed, as an alternative of obvious design choice, noting that a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Regarding claims **9, 10**, the claims are interpreted and rejected for the same reason as set forth in claim 1 above.

Allowable Subject Matter

5. Claims 3, 6, 8, 12, 15, 17 are allowed.

Response to Arguments

6. Applicant's arguments with respect to claims 1, 2, 4, 5, 7, 9-11, 13, 14, 16 have been considered but are moot in view of the new ground(s) of rejection (112 first paragraph rejection).

As to Applicant's argument regarding the combination of Li'024 and Li'392, the examiner asserts that the combination is directed to the number of antennas with respect to the number of users, not to combine a CDMA system with an OFDM system. Here, since one skilled in the art would recognize that the dimension of antennas (M), the dimension of filters (P) and the dimension of users (N) in Li'024 can be arbitrary numbers depending on design choices, it would have been obvious to one skilled in the art at the time the invention was made to modify Li'024 to provide a larger number of antennas with respect to a smaller number of detected user as mentioned by Li'092 (i.e, $M \text{ antennas} > N \text{ users}$), thereby providing a plurality of basis signals $d[n]$ together

Art Unit: 2618

having **fewer** space-time dimensions than the space-time dimensions of the combined antenna signals as claimed, as an alternative of obvious design choice, noting that a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., details of basic signals $y[n]$ that would distinguish the claimed basic signals from the $d[n]$ signals in Li'024, or features such as cross-coupling before spatial combiner, perform beamforming and nulling in the signal processing unit, equalization, etc) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Here, the claims just merely recite a common processing section, a plurality of signal processing units and filters with their corresponding dimensions **without** specifically reciting any **function** of sections/units. Therefore, it would have been obvious to one skilled in the art at the time the invention was made to provide a receiver with such section/units where their dimension can be any arbitrary number. Note that a change in size (i.e, dimension of matrixes) is generally recognized as being within the level of ordinary skill in the art.

For example, a multiplication of matrixes $[5 \times M].[M \times K].[K \times L].[L \times 9]$ would produce a matrix of $[5 \times 9]$, where M, K, L can be chosen from any arbitrary number.

Art Unit: 2618

For foregoing reasons, the examiner believes that the pending claims are not allowable over the cited prior art.

Conclusion

7. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300 (for **formal** communications intended for entry)

(571)-273-7893 (for informal or **draft** communications).

Hand-delivered responses should be brought to Customer Service Window,
Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893, Monday-Thursday (9:00 AM - 5:00 PM).

Or to Nay Maung (Supervisor) whose telephone number is (571) 272-7882.

/Duc M. Nguyen/

Primary Examiner, Art Unit 2618

Mar 24, 2010